ciety of New South Wales, The Entomological Society of Australia (N.S.W.), a Fellow of the Royal Zoological Society of New South Wales and an emeritus member of the Australian Institute of Agricultural Science.

Mr Zeck's record as a writer on agricultural entomology, a taxonomist, entomological artist and officer of scientific societies in Sydney, has made him a worthy recipient of the Australian Natural History Medallion.

Mammal Remains from the Grampians, Victoria

By N. A. WAKEFIELD*

During Easter this year, Mr R. M. Thornton, of Ringwood East, took his family to see some aboriginal shelters and paintings in the northern section of the Victoria Range of the Victorian Grampians. His son, Peter, located a small deposit of animal bones, while investigating a recess in a sandstone outcrop. Peter collected a small sample of these and they were eventually forwarded to me by Mr N. S. Bennett of the Stawell Field Naturalists Club.

The contents of the sample indicated that the discovery was of considerable value, so an excursion was arranged, in July, to procure the remainder of the material and to examine the site and its surroundings.

Several naturalists attended, from the Horsham and Stawell clubs, and rendezvous was made where a forestry access road, appropriately named "The Goat Track", took off from the Syphon Road in the Victoria Valley. The ascent was made in a Landrover, brought out for the purpose by Mr John Donovan, Assistant Forester of Stawell.

A four-mile drive accomplished the ascent of the scarp and a short traverse of some plateau country, to the vicinity of Cultivation Creek, where we joined forces with another party of three naturalists from Hamilton and Casterton, who had walked through from the Glen Isla side of the range.

The site of the bone deposit was a well-sheltered cavity which penetrated about ten feet into a sandstone mass. It was several feet wide and, as the floor sloped steeply and the roof was only about four feet above, the collecting of material was rather difficult. A few of the party spent an hour at the job before lunch, and I completed the task during the afternoon while the others went to view some aboriginal art in a recently discovered rock shelter.

As no sieve was available, the deposit was collected *in toto*. There was less than a cubic foot of it but, when processed a few days later, it yielded skeletal material which included remains of over 400 small mammals representing 22 native species. Details of these are set out in Table 1, the numbers being based on counts of lower jaw-bones (dentaries).

* Department of Zoology and Comparative Physiology, Monash University, Clayton, Victoria.

TABLE 1

Mammal Species and Approximate Numbers of Individuals in the Victoria Range Deposit

Dasyuridae*	
Sminthopsis c.f. *leucopus* (White-footed Dunnart)	16
Antechinus swainsonii (Dusky Phascogale)	13
Antechinus stuartii (Brown Phascogale)	46
Peramelidae	
Isoodon obesulus (Short-nosed Bandicoot)	2
Perameles bougainville (Little Barred Bandicoot)	22
Phalangeridae	
Acrobates pygmaeus (Feathertail)	18
Cercartetus nanus (Pigmy-possum)	75
Petaurus breviceps (Sugar Glider)	1
Pseudocheirus peregrinus (Ringtail)	1
Macropodidae	
Bettongia gaimardi (Bettong)	1
Potorous tridactylus (Potoroo)	3
Muridae	
Rattus greyii (Grey's Rat)	2
Rattus lutreolus (Swamp-rat)	4
Pseudomys auritus (Long-eared Pseudo-rat)	24
Thetomys c.f. *gracilicaudatus* (Queensland Thetomys)	17
Gyomys fumeus (Smoky Mouse)	148
Gyomys c.f. *novaehollandiae* (New-Holland Mouse)	1
Mastacomys fuscus (Broad-toothed Rat)	7
Conilurus albipes (White-footed Rabbit-rat)	1
Vespertilionidae	
Nyctophilus timoriensis (Greater Long-eared Bat)	1
Chalinolobus morio (Chocolate Bat)	1
Scotemus sp. (Broad-nosed Bat)	1

Besides the native mammal specimens, the deposit contained the jawbone of a domestic cat, remains of several lizard species and of a great variety of beetles.

NOTES ON IDENTIFICATION AND DISTRIBUTION

Sminthopsis. Detailed measurement of this Victoria Range material shows it to be of a population of smaller animals than those identified from the Fern Cave near Portland (Wakefield, 1963a). It could be of *murina* rather than *leucopus*, as the former has been collected at Bordertown, S.A., though never authentically recorded in Victoria.

Antechinus. The occurrence in the Grampians of both the species listed was proved last year, when R. M. Warneke obtained specimens of them near Halls Gap; and I caught a Brown Phascogale at the foot of the Victoria Range, beside the Goat Track, during the recent July excursion. It is remarkable that *A. flavipes* (Yellow-footed Phascogale) was not represented in the Victoria Range deposit, for it is widespread in the Grampians.

Perameles bougainville. The Victoria Range material is not distinguishable from central and north-western Australian specimens. The suggestion made by Tate (1948), that *bougainville*, *fasciata*, *notina* and *eremiana*

* There was additional material of about 12 small dasyurids, not specifically identified, but presumably of the three species listed in the Table.

comprises a single species, appears to be justified. Although Victoria has been included in the range of "*fasciata*" by various authors (eg. Troughton, 1956), the Victoria Range specimens provide the first tangible proof that the species did occur in the state. As far as is known, the animal has now died out in south-eastern Australia.

Bettongia gaimardi. This bettong was represented in the deposit by a single dentary of a subadult individual. Its one-time occurrence in western Victoria was demonstrated by recent subfossil specimens from Mount Hamilton and near Portland (Wakefield 1963, 1963a). In this connexion it is interesting to note a comment by Finlayson (1958), when discussing *B. penicillata*, that he had "accounts of a nest building bettong from West Victoria generally in 1854, and the Grampians district in 1910".

Potorous tridactylus. There are unconfirmed local reports that the potoroo still survives on the north-eastern fringe of the Grampians.

Rattus greyii. In Victoria, Grey's Rat is known only from the Portland-Nelson forests of the extreme south-west. It has not been recorded, as a living animal, in the Grampians, but there seems to be no reason why it should not still occur there.

Gyomys fumeus. The Smoky Mouse specimens constituted a third of the mammals in the Victoria Range deposit, and it was very abundant also in eastern Victorian sub-fossil collections (Wakefield, 1960). The species evidently shared in the sudden disappearance of several of the pseudomid group, about a century ago, from south-eastern Australia. An indication of this catastrophe, and data about the various species concerned, have already been noted in the references cited here. The survival of the Smoky Mouse in the Grampians (and in Victoria) was proved by its rediscovery recently near Halls Gap (Warneke, 1963).

Scoteinus sp. This and the two other bats in the Victoria Range deposit have been identified by R. M. Ryan, National Museum of Victoria. He remarks that *Scoteinus* is well-known to him in north-western Victoria though not credited for the state in current mammal literature.

Identity of the Predator

It was obvious that owls had been responsible for the accumulation of bones. Their perch had been a ledge at the end of the recess, and many of their disgorged pellets must have rolled down the sloping floor, dropped to the ground below, and eventually decomposed completely. Fortunately there were a few slabs of stone here and there in the cave, and these had trapped a certain amount of material. Some pellets were sufficiently well preserved to be recognizable as those of a species of *Tyto*. The prey ranged in size up to adult bandicoots and half-grown rat-kangaroos. This indicates that the bird was the Masked Owl, *Tyto novae-hollandiae*.

The cat jawbone suggests that the roost was still used after European settlement of the country, but the absence of ma-

terial either of rabbits or of introduced murids demonstrates that the birds deserted the place many years ago. This pattern of timing is the same in all cave accumulations of owl pellet material known in Victoria; none has been in use in recent years.

The Victoria Range Habitat

Nowadays, the plateau in the vicinity of the bone deposit is an area of dense tough shrubbery, interrupted at intervals by jagged sandstone outcrops. When I suggested to the party that this would not have been the original type of vegetation, the comment was confirmed by two of the local naturalists, who recounted details that had been passed on to them by old residents of the district. It had been the practice, for instance, to graze sheep on the Victoria Range plateau in the early days. But, to promote the growth of fresh grass, it was necessary of course to fire the country periodically. The change from grassy parkland to the present tangle of scrub was the result of this procedure.

In its original state, the locality would have suited the barred bandicoots, bettongs and such murids as the rabbit-rat. Even if small populations of these mav have persisted in favourable places, the advent of the European fox would have lessened or precluded their chances of survival. There were fox droppings in the recess with the bone deposit.

Appendix: Black Range Deposit

A small handful of fragmentary bone material was collected in the Black Range last year by A. C. Beauglehole of the Portland Field Naturalists Club. In it there were one or two specimens each of Brown Phascogale (*Antechinus stuartii*), Pigmy-possum (*Cercartetus nanus*), Grey's Rat (*Rattus greyii*), Smoky Mouse (*Gyomys fumeus*) and the Thetomys.

The Black Range is the westernmost outlier of the Grampians group and is about 15 miles WNW. of the location of the Victoria Range deposit. Apart from the fact that, in all five cases, the additional locality record is of value, this lot demonstrates the importance of reporting the occurrence of such material or collecting it, no matter how fragmentary it may appear to be.

Acknowledgement

The cost of the excursion to the Victoria Range was defrayed out of a current grant from the C.S.I.R.O. Science and Industry Endowment Fund.

References

Finlayson, H. H., 1958. On Central Australian mammals (with notice of related species from adjacent tracts) Part 3—The Potoroinae. *Rec. S. Aust. Mus. 13* (*2*) : 235-302.

Tate, G. H. H., 1948. Results of the Archbold expeditions. No. 60. Studies in the Peramelidae (Marsupialia). *Bull. Amer. Mus. Nat. Hist. 92* (*6*) : 313-346.

Troughton, Ellis, 1957. *Furred animals of Australia, Ed. 6.* Angus & Robertson, Sydney.

Wakefield, N., 1960. Recent mammal bones in the Buchan district—2. *Vict. Nat., 77* (*8*) : 227-240.

———, 1963. Sub-fossils from Mount Hamilton, Victoria. *Vict. Nat., 79* (*11*) : 323-330.

———, 1963a. Mammal sub-fossils from near Portland, Victoria. *Vict. Nat., 80* (*2*) : 39-45.

Warneke, R. M., 1963. Rare today—tomorrow . . . ? *Victoria's Resources 5* (*1*) : 24-5.